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E36 J03

HITF 25.10.77  
\*J5 4061-088

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**Electrolytic decomposition of steam to hydrogen and oxygen - the steam being dissolved in electrolyte of fused sodium hydroxide**

Electrolysis is carried out at temp. 322 - 400°C while supplying steam to cathode chamber. Electric voltage in electrolysing vessel is made minimum and the process becomes very economical. By restricting the electrolysing temp. within the above range, the amt. of the steam dissolved in the fused NaOH is increased, thereby it becomes possible to use as the electrode an economical material, e.g. Ni etc..

It is not necessary to supply the steam continuously, but the supply is carried-out intermittently. Heat loss is decreased, and corrosion of the electrolysis vessel is reduced.

(4pp34).

- (4 ppgs)

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E36 J03

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HITACHI SHIPBLD ENGG KK  
25.10.77-JA-128336 (17.05.79) C25b-01/04  
Electrolysis of water - at 330-500 degrees C using sintered beta-alumina as diaphragm

Water is effectively and economically decomposed by electrolysis into H<sub>2</sub> and O<sub>2</sub> by carrying-out the electrolysis at 330 - 500°C while supplying steam to anode chamber by the use of sintered beta-alumina having an Na<sup>+</sup> mobility of 1, and of formula: Na<sub>2</sub>O 0.5-11 Al<sub>2</sub>O<sub>3</sub>, as the diaphragm, and fused NaOH as the electrolysing liquor, resp. As the electrode, Ni is suitably used due to its excellent anti-corrosive property against the fused NaOH. The mixing of O<sub>2</sub> and H<sub>2</sub> generated in both of the chambers through the diaphragm is completely prevented by the use of the beta-alumina diaphragm, thereby the electrolysis is carried-out economically without danger of explosion, and it becomes possible to bring both of the electrodes as close as possible to the diaphragm, thereby loss in electric voltage is made very low.(5pp34).

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ARAKAWA T  
21.08.81-JP.130054 (28.02.83) C25b.01/04 C25b.11/06 C25b.

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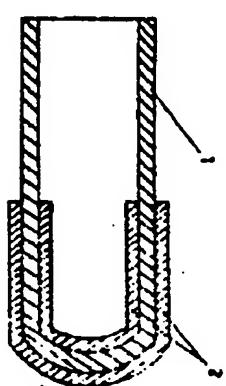
Electrolysis cell for steam for hydrogen mfr. - uses metal oxide solid electrolyte and ruthenium, rhodium, palladium, silver, iridium, platinum and/or gold as electrodes

J5.8034-183

E(31.A.34.D1.34.E.35.E.35.L) J(3-B2)

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hydrogen gas atmosphere.(5ppw 121).



USE/ADVANTAGE  
Electrolysis of steam for prodn. of hydrogen can be effected at a lower temp. and at high current efficiency.

DETAILS

The cell contains an outer alumina pipe (3), an inner stainless steel pipe (4) and lead wires (5,6). The electrode (2) is pref. composed of Ag, and it can be produced e.g. by applying a vacuum vapour deposited Ag layer on the solid electrolyte surface, and then heat treating at 600°C. in a

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★ ZHEN/ X25 94-084061/11 ★ CN 1072465-A  
Hydrogen prepn. from microwave electrolysis of steam - uses appts.  
comprising microwave generator and electrolysis tank giving high  
electrolysis efficiency with no corrosion to the appts. No Abstract  
ZHENG J 92.08.29 92CN-110190  
E36 J03 (93.05.26) C25B 1/04  
N94-085736 X25-B02B X25-R01

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